ABSTRACT

An optical storage medium of the present invention enables storage of data with high precision at high speed, and rewriting of data at high speed without an erasing process. Optical storage, reading and retrieving methods and optical storage, reading, and retrieving apparatuses using the medium are also provided. The optical storage medium has at least a polarization-sensitive member having the photo-induced birefringence property, such as a member made of polyester polymer having cyanoazobenzene as a side chain. The above apparatuses have spatial light modulator capable of modulating polarization. The modulator provides information of bit of two-dimensional data to each corresponding pixel by application or non-application of a voltage, and modulates the polarization of the beam incident on each pixel. Thereby, a signal beam transmitted through the spatial light modulator having a spatial polarization modulation corresponding to the two-dimensional data is obtained. The signal beam illuminates the optical storage medium, and at the same time, a reference beam illuminates the same region in the medium where the signal beam illuminates. Thus a hologram of the polarization modulation of the signal beam corresponding to the two-dimensional data is stored in the optical storage medium.